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ABSTRACT

This publication contains 25 subjects appropriate for use in a competency list for the occupation of computer programmer/analyst, 1 of 12 occupations within the business/computer technologies cluster. Each unit consists of a number of competencies; a list of competency builders is provided for each competency. Titles of the 25 units are as follows: employability skills; professionalism; teamwork; professional and ethical standards; economic and business principles; customer relations; problem analysis; project management; technical documentation; basic personal computer (PC) concepts; packaged PC applications; general office functions; office technology; general accounting functions; specialized accounting functions; computer operations; software methodology; operating systems; application programming and design; network operations; basic mainframe concepts; computer hardware design; database modeling and design; small business management; and supervision. (YLB)

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TECH PREP

"GET SERIOUS . . . ABOUT SUCCESS"

CE070010

Computer Programmer/Analyst

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Computer Programmer/Analyst

NOTE: Each TCP should respond to labor market demands in your area. Therefore, the following pages should be examined before being selected for use in TCP Part I (See "The TCP Process" Tab). For example, some units may not apply to your situation, nor might all the competencies within each unit be appropriate. Also, note that several units appear within each of the twelve occupations in this binder. Those "common" units should only appear once in the draft competency list for TCP Part I if you are compiling several occupations in a cluster format (See "TCP Matrix" Tab).

Units to Consider:	Page
Employability Skills	CP-3
Professionalism	CP-8
Teamwork	CP-12
Professional and Ethical Standards	CP-14
Economic and Business Principles	CP-16
Customer Relations	CP-20
Problem Analysis	CP-21
Project Management	CP-22
Technical Documentation	CP-23
Basic Personal Computer Concepts	CP-24
Packaged PC Applications	CP-26
General Office Functions	CP-31
Office Technology	CP-37
General Accounting Functions	CP-40
Specialized Accounting Functions	CP-45
Computer Operations	CP-51
Software Methodology	CP-55
Operating Systems	CP-57
Application Programming and Design	CP-61
Network Operations	CP-66
Basic Mainframe Concepts	CP-71
Computer Hardware Design	CP-73
Database Modeling and Design	CP-77
Small Business Management	CP-78
Supervision	CP-84

DON'T FORGET TO INSERT YOUR ACADEMIC COMPETENCIES HERE

Communications Literacy, Mathematics Literacy, Science Literacy, and Technology Literacy have been removed so that you may insert your own academic lists here.

COMMUNICATIONS LITERACY

(e.g., Reading, Writing, Speaking, and Listening)

MATHEMATICS LITERACY

(e.g., Algebra, Geometry, Trigonometry, Calculus)

SCIENCE LITERACY

(e.g., Physical Science, Environmental Science, Agriscience, Biology, Chemistry, Physics, Anatomy & Physiology)

TECHNOLOGY LITERACY

(i.e., the impact of technology on humans and their home, work, and play environments)

Unit: Employability Skills

Competency: Develop a career plan

Competency Builders:

Identify current interests and aptitudes
Identify common barriers to employment
Describe strategies to overcome employment barriers
Locate resources for finding employment
Research job trends
Identify career options
Identify advantages and disadvantages of career options (in addition to other than monetary)
Identify job requirements
Investigate education/training opportunities
Evaluate personal strengths and weaknesses

Competency: Prepare for employment

Competency Builders:

Identify traditional and non-traditional employment sources
Identify present and future employment opportunities (by geographic location)
Research job opportunities, including non-traditional careers
Compare salary ranges and benefit packages
Compile occupational profile
Identify rights and responsibilities of equal employment opportunity laws
Design resume and cover letter
Target resume
Secure references
Investigate generic and specific employment tests (e.g., civil service exam; drug screening)
Use follow-up techniques to enhance employment potential
Demonstrate legible written communication skills using correct grammar, spelling, punctuation, and concise wording
Describe methods for handling illegal questions on job application forms and during interviews
Write letter of application
Research prospective employer and services performed
Explain critical importance of personal appearance, hygiene, and demeanor
Interpret job description
Demonstrate appropriate interview question and answer techniques
Demonstrate methods for handling difficult interview questions
Evaluate job offers
Write letter of acceptance
Write letter of declination
Demonstrate good listening skills
Ask for the job tactfully
Participate in extracurricular activities (e.g., student government, community projects,)

Competency: Evaluate the importance of self-esteem as an employability skill

Competency Builders:

Identify factors that affect self-esteem
Compare effects of low self-esteem and high self-esteem
Identify strategies to promote positive self-esteem

Competency: Demonstrate job retention skills

Competency Builders:

Identify employer expectations regarding job performance, work habits, attitudes, personal appearance, and hygiene
Exhibit appropriate work habits and attitude
Demonstrate ability to set priorities
Identify behaviors to establish successful working relationships
Identify alternatives for dealing with harassment, bias, and discrimination based on race, color, national origin, sex, religion, handicap, or age
Identify opportunities for advancement
List reasons for termination
List consequences of being absent frequently from job
List consequences of frequently arriving late for work
Demonstrate interpersonal relations skills (i.e., verbal and written)
Demonstrate negotiation skills
Demonstrate teamwork
Follow chain-of-command
Exhibit appropriate job dedication

Competency: Demonstrate knowledge of work ethic

Competency Builders:

Define work ethic
Identify factors that influence work ethic
Differentiate law and ethics
Describe how personal values are reflected in work ethic
Describe how interactions in the workplace affect personal work ethic
Describe how life changes affect personal work ethic

Competency: Exhibit appropriate work ethic

Competency Builders:

Use time-management techniques
Avoid personal activity during work hours
Attend work as scheduled
Adhere to company and/or governmental policies, procedures, rules, and regulations
Exercise confidentiality
Demonstrate appropriate human relations skills
Adhere to rules of conduct
Accept constructive criticism
Offer constructive criticism
Take pride in work
Resolve conflict
Manage stress
Avoid sexual connotations and harassment
Adjust to changes in the workplace
Demonstrate punctuality
Assume responsibility for personal decisions and actions
Take responsibility for assignments
Follow chain-of-command

Competency: Apply decision-making techniques

Competency Builders:

Identify decision to be made
Identify ownership of decision to be made
Identify possible alternatives and their consequences
Make decisions based on facts, legality, ethics, goals, and/or culture
Apply time factor(s)
Present decision to be implemented
Evaluate decision made
Take responsibility for decision

Competency: Apply problem-solving techniques

Competency Builders:

Identify problem
Select appropriate problem solving tools/techniques
Identify root problem cause(s)
Track root problem cause(s)
Identify possible solutions and their consequences (e.g., long term, short term, crisis)
Use resources to explore possible solutions to problem
Contrast advantages and disadvantages of each solution
Identify appropriate action
Evaluate results
Identify post-preventive action

Competency: Exhibit characteristics for job advancement

Competency Builders:

Display positive attitude
Demonstrate knowledge of position
Perform quality work
Adapt to changing situations and technology
Demonstrate capability/responsibility for different positions
Identify characteristics of effective leaders
Identify opportunities for leadership in work place/community
Demonstrate initiative to affect change in workplace
Participate in continuing education/training program
Responds appropriately to criticism from employer, supervisor, or other employees
Exhibit awareness of corporate culture
Prepare for job setbacks
Exhibit continual growth based on performance evaluation
Set realistic goals

Unit: Professionalism

Competency: Project professional image

Competency Builders:

Define professionalism
Exhibit professional appearance
Exhibit professional manners
Project professional attitude
Identify individuals' vital role in organization
Exhibit proper etiquette in professionally-related situations

Competency: Achieve individual and professional goals

Competency Builders:

Set flexible, realistic, and measurable goals
Identify potential barriers to achieving goals
Identify strategies for addressing barriers to goal achievement
Breakdown long-term goals into short-term goals
Prioritize goals
Commit to goals
Adjust goals
Obtain support for goals
Reward goal achievement

Competency: Manage personal finances

Competency Builders:

Explain need for personal management records
Balance checkbook
Identify tax obligations
Analyze how credit affects financial security
Compare types and methods of investments
Compare types and methods of borrowing
Compare types and methods of insurance
Compare types of retirement options/plans
Identify discriminatory vs. non-discriminatory expenditures

Competency: Support community well-being

Competency Builders:

Identify environmental, educational, and social issues
Participate in social and/or community activities

Competency: Achieve organizational goals

Competency Builders:

Evaluate personal goals in relation to organizational goals
Monitor progress by evaluating feedback
List responsibilities in relation to organization goals
Accomplish assigned tasks
Exercise responsibility in relation to organizational goals
Set appropriate personal performance standards
Communicate goals with supervisor and peers
Demonstrate knowledge of products and services
Promote organizational image and mission

Competency: Demonstrate positive relations in the workplace

Competency Builders:

Identify personality types of self and other
Identify various management styles
Support employer expectations
Support employer decisions
Accept constructive criticism
Give constructive feedback
Adapt to changes in workplace
List factors to consider before resigning
Write letter of resignation

Competency: Manage stressful situations

Competency Builders:

Accept stress as part of daily life
Identify personal and professional factors contributing to stress
Describe physical and emotional responses to stress
Evaluate positive and negative effects of stress on productivity
Identify strategies for reducing stress
Implement strategies to manage stress
Create strategies for developing and maintaining support systems

Competency: Analyze effects of family on work and work on family

Competency Builders:

Identify how family values, goals, and priorities are reflected in work place
Identify responsibilities and rewards associated with paid and non-paid work
Identify responsibilities and rewards associated with families
Explain how family responsibilities can conflict with work
Explain how work can conflict with family responsibilities
Explain how work-related stress can affect families
Explain how family-related stress can affect work
Identify family support systems and resources
Identify work-related support systems and resources
Communicate with family regarding work

Competency: Apply lifelong learning skills

Competency Builders:

Define lifelong learning
Identify factors that cause need for lifelong learning
Analyze effects of change
Identify reasons why goals change
Describe importance of flexibility and adaptability
Evaluate need for continuing education/training

Competency: Manage professional development

Competency Builders:

Identify career opportunities
Modify career plan
Participate in continuing education/training opportunities
Document continuing education/training
Read profession-related manuals, technical journals, and periodicals
Attend meetings, workshops, seminars, conferences, and demonstrations
Participate in professional organizations
Build personal/professional mentor relationship
Build personal/professional support system
Build professional network
Strengthen communication skills
Strengthen leadership skills
Strengthen management skills

Unit: Teamwork

Competency: Demonstrate knowledge of teamwork

Competency Builders:

Define empowerment
Differentiate work groups and teams
Identify conditions essential to teamwork (e.g., brainstorming)
Explain influence of culture (e.g., corporate, community) on teamwork
Identify appropriate situations for using teams
Define team structures (e.g., cross functional, quality improvement, task force, quality circles)
Identify team building concepts
Describe characteristics and dynamics of teams
Identify characteristics of effective team leaders and members
Identify responsibilities of a valuable team member
Identify methods of involving each member of a team
Explain how individuals from various backgrounds contribute to work-related situations (e.g., technical training, cultural heritage)
Explain the purpose of facilitators
Define consensus
Define reward/recognition system

Competency: Demonstrate teamwork

Competency Builders:

Identify purpose of team and intended goal (include time frames)
Structure team around purpose
Define responsibilities of team members
Contribute to efficiency and success of team
Work toward individual and team milestones
Analyze results of team project
Facilitate a team meeting
Assist team member(s) with problem
Monitor time frame
Stress continuous improvement
Accept failure as part of learning

Competency: Use teamwork to solve problems

Competency Builders:

Identify appropriate situations for using teams
Use problem-solving process in a team setting
Identify quality management processes/techniques
Identify quality assurance processes/techniques
Prepare presentation

Competency: Conduct team meetings

Competency Builders:

Plan agenda
Schedule meeting and location
Invite appropriate personnel
Solicit outside speakers as needed
Assign someone to take minutes
Facilitate introductions
Invite questions and comments and group participation
Focus team on agenda items
Assign appropriate action, time frame and accountability to tasks
Monitor time
Close meeting on time
Publish minutes in timely manner
Set ground rules
Avoid placing individual agendas above the group's agenda

Unit: Professional and Ethical Standards

Competency: Explain professional responsibilities

Competency Builders:

Explain the need for professional and ethical standards
Explain responsibility of the individual to apply ethical standards
Identify responsibility to client(s) or employer(s)
Explain employer's consequences of unprofessional and/or unethical employee behavior
Identify responsibility to self (e.g., professional appearance and limitations) and to profession
Explain importance of conflict resolution in the workplace

Competency: Describe self-managed employees

Competency Builders:

Explain the need for organizing tasks
Explain management-by-objectives
Explain importance of planning, both long-term and short-term
Explain importance of evaluating progress
Explain importance of reporting progress
Explain time management
Explain the benefit of creative brainstorming and innovative thinking

Competency: Describe intellectual property

Competency Builders:

Explain legal ownership of proprietary assets produced by the computing professional
Explain public policy
Explain rights of the originator
Explain rights of the public
Explain patent
Explain copyright
Explain licenses
Explain confidentiality

Competency: Apply professional and ethical standards

Competency Builders:

Identify computing industry's standards
Describe computing industry's code of ethics
Explain various ethics established by computing societies
Apply various ethics established by computing societies

Unit: Economic and Business Principles

Competency: Describe basic economic concepts

Competency Builders:

Identify importance of economic resources
Explain concept of economic resources
Explain importance of economic resources
Explain concept of economic goods and services
Differentiate between economic goods and services
Differentiate between needs and wants
Explain concept of supply and demand
Explain concept of price
Explain how supply, demand, and price are related
Explain concept of private enterprise and business ownership
Explain concept of profit
Explain concept of risk
Explain concept of competition
Explain relationship among risk, competition, and profit

Competency: Conduct training

Competency Builders:

Secure training resources, materials, and equipment
Assess training needs
Train employees
Evaluate progress
Provide appropriate feedback

Competency: Evaluate economic systems

Competency Builders:

Compare types of economic systems
Research free enterprise system
Interpret relationship between government and business
Interpret relationship between labor and management

Competency: Illustrate basic economic principles

Competency Builders:

Illustrate global economic and world market applications
Illustrate economic cycles (e.g., unemployment, recession, inflation, budget deficits)
Illustrate economic activity's affect on business (e.g., financial, competitor indicators, industry)·

Competency: Analyze cost and profit influences

Competency Builders:

Identify importance of maximizing quality
Identify importance of maximizing productivity
Contrast specialized training and cross training
Contrast labor and management
Contrast government and business

Competency: Illustrate economic indicators and trends

Competency Builders:

Define gross national product and gross domestic product
Interpret impact of interest rates
Interpret impact of government spending
Interpret impact of seasonal business cycles
Interpret impact of inflation, growth, recession, and unemployment
Interpret impact of national and world events
Interpret impact of the growth of international trade

Competency: Explain basic international trade concepts

Competency Builders:

Explain nature and importance of international trade
Contrast advantages and disadvantages of marketing in international trade
Explain balance of trade concepts
Describe impact of foreign investment

Competency: Explain basic business concepts

Competency Builders:

Identify functions of business
Explain role of management
Explain role of labor
Explain concept of service as a product
Explain role of administration
Explain role of operations
Identify role of company objectives
Identify importance of ethical business practices
Identify types of ownership
Identify components of a business plan

Competency: Summarize business principles

Competency Builders:

Explain business organizations and functions
Describe business reporting and information flow
Map interface of departmental functions
Identify communication channels (e.g., formal, informal)
Explain total quality management (TQM) principles

Competency: Illustrate legal concepts

Competency Builders:

Define legal terminology
Explain business law concepts
Interpret contracts and/or legal documents
Explain relationship of laws and regulations to company contracts, policies, and procedures
Explain laws relating to working conditions, wages and hours, civil rights, social security, disability, and unemployment insurance

Competency: Explain role of marketing

Competency Builders:

Explain aspects of sound business image
Identify purposes of marketing
Identify functions of marketing
Describe effects of marketing
Explain product/service variety
Identify target markets
Define sales potential
Explain pricing strategies
Differentiate advertising campaigns
Explain advantages and disadvantages of advertising agencies
Describe sales incentive programs
Maintain marketing feedback and make appropriate changes
Identify types of marketing strategies and the advantage and disadvantage of each (e.g. phone, mail, person)
Design monitor plan

Competency: Serve customers/clients

Competency Builders:

Identify importance of customer
Identify customer services to provide
Relate to customers in timely fashion
Identify customer needs and wants
Gather complete and accurate information
Apply customer service concepts and terminology
Identify methods for addressing dissatisfied customers

Unit: Customer Relations

Competency: Demonstrate positive relations with customers

Competency Builders:

Identify importance of customers to business
Differentiate between customer needs and wants
Provide prompt and courteous service
Resolve customer inquiries and complaints and/or refer customer to appropriate person
Identify methods of addressing dissatisfied customers

Competency: Perform scheduling functions to meet customers needs

Competency Builders:

Create calendar/schedule
Maintain appointment calendars
Process requests for appointments
Verify appointments
Notify customer of changes in schedule
Manage scheduling conflicts

Unit: Problem Analysis

Competency: Appraise situations

Competency Builders:

Identify concerns
Classify concerns
Set priorities
Identify resolution process
Plan resolution

Competency: Analyze potential problems

Competency Builders:

Identify potential problems
Identify likely causes
Identify preventive actions
Identify contingent actions

Competency: Analyze actual problems

Competency Builders:

Identify deviation
Identify problem and possible causes
Test for probable causes
Verify cause

Competency: Analyze decisions

Competency Builders:

Identify objective(s)
Classify objective(s)
Identify alternatives
Evaluate alternatives
Assess risks
Make final choice

Unit: Project Management

Competency: Explain project management

Competency Builders:

Identify project purpose/goal
Identify project objectives
Identify work breakdown structure (WBS)
Identify resource requirements

Competency: Plan projects

Competency Builders:

Apply responsibility assignment matrix (RAM)
Apply Gantt or bar charts
Apply network diagrams
Apply critical path method (CPM)
Apply project education and review techniques
Apply software programs

Competency: Implement projects

Competency Builders:

Monitor project
Control project
Modify project

Competency: Evaluate projects

Competency Builders:

Analyze performance
Close-out project evaluation
Draw project management conclusions

Unit: Technical Documentation

Competency: Demonstrate proficiency in technical documentation

Competency Builders:

Identify parameters
Ask questions
Interpret specifications or drawings
Record process (e.g., flowchart, step-by-step)
Record data
Maintain test logs
Compile cumulative reference/record

Competency: Demonstrate proficiency in technical report writing

Competency Builders:

Use data books and cross reference/technical manuals
Identify type of report needed
Compile relevant data
Design applicable charts and graphs
Analyze data
Draw conclusions
Outline reports
Write reports
Present reports

Unit: Basic Personal Computer Concepts

Competency: Explain use of personal computers in business

Competency Builders:

Describe the impact of computer use on individuals and businesses
Identify basic applications of computers in business
Identify automated business systems and electronic media
Identify different types and sizes of computers
Define input, processor, output, and storage units
Identify how PCs integrate with other information technologies (e.g., scanners, mainframes)
Describe impact of computer use on individuals and business
Identify basic applications of computers in business

Competency: Describe personal computer operations

Competency Builders:

Explain how data is stored in main computer memory
Explain how a computer system executes program instruction
Explain electronic storage capacity
Explain electronic units of measure and how they represent data
Identify data storage techniques
Identify types of memory
Explain different types of input and output

Competency: Explain information processing

Competency Builders:

Define operating systems
Describe the difference between data files and program files
Demonstrate knowledge of system commands
Define software types and functions
Describe basic disk operation and care
List business applications of software package
List advantages and disadvantages of integrated and dedicated software

Competency: Demonstrate computer literacy

Competency Builders:

Identify computer components
Identify parallel versus serial ports
Explain differences between conventional, expanded, and extended memory
Identify use of storage media
List commands that affect disk operation
Use disk operating system to format disks
Originate directories and subdirectories
Explain common configuration variables
Explain device driver concepts
Demonstrate commands that open, close, copy, delete, and rename files on disk
Keyboard document(s) using computer

Unit: Packaged PC Applications

Competency: Explain software applications

Competency Builders:

Describe need for application software
Describe different types of software applications
Explain advantages and disadvantages of various software applications
List software sources
Explain copyright laws for software

Competency: Explain spreadsheet packages

Competency Builders:

Define spreadsheet
Demonstrate knowledge of basic spreadsheet terminology
Define components of spreadsheets
Describe implementation of spreadsheet operations in business scope

Competency: Perform word processing functions

Competency Builders:

Define word processing terminology
Explain functions of word processing software
Explain word processing applications
Use appropriate reference materials
Keyboard efficiently by touch
Use mouse
Initialize diskette
Prepare backup file
Maintain backup file
Update spelling dictionary and spell check
Perform document functions (e.g., locate, rename, delete, save, retrieve, copy)
Perform formatting functions (e.g., set margins and tabs, center, underline, bold, cut and paste)
Use edit features
Use sort features
Add page numbers to document
Add headers and footers
Print files, pages, screens and blocks of text
Verify accuracy of output
Create a document
Save a document to disk
Retrieve a document from disk
Edit an existing document
Describe word-wrap
Print a document
Create glossary file
Store boilerplate material
Compose documents at keyboard
Tabulate multiple columns
Prepare new documents from existing ones
Merge selected copy with new information
Prepare various types of table options
Index text
Format text
Integrate database, spreadsheet and graphic files
Convert documents from one system to another
Demonstrate use of computer thesaurus
Use multimedia techniques/resources

Competency: Use spreadsheet packages

Competency Builders:

Use spell check
Execute an electronic spreadsheet
Enter data, formulas, and functions
Differentiate between labels and numbers
Compare absolute and relative addressing
Speculate using "what if..." questions
Sequence keystrokes in the creation of a macro
Create database within spreadsheet and perform data query functions
Move around in spreadsheet and correct errors
Format spreadsheet
Create graphs
Print graphs
Save previously saved files
Load previously saved files
Replicate cells using copy commands
Use electronic spreadsheet to complete business application
Use spreadsheet to plan financial strategies
Prepare spreadsheet
Use multimedia techniques/resources

Competency: Explain database packages

Competency Builders:

Define database
Explain terms used in database systems
Describe common functions of database systems

Competency: Use database packages

Competency Builders:

Use database package to create, input, edit, and display fields and records
Analyze structure of database files
Perform calculations with a database file
Alter structure of database file
Sort records based on multiple fields
Identify advanced database technology
Use appropriate reference materials
Create relational database
Enter elements into database
Proofread database
Edit database
Design report formats
Apply database management system (DBMS) commands
Print reports using data from multiple databases
Use database files with other application software
Verify accuracy of output (e.g., edit reports)
Use multimedia techniques/resources

Competency: Explain function of shared environments

Competency Builders:

List purposes of a network environment
Define electronic mail
Identify advantages and disadvantages of electronic mail
Describe impact of local and wide area networks on mail delivery

Competency: Use a shared environment

Competency Builders:

Compose electronic messages
Send electronic messages using appropriate format
List categories of electronic mail service
Transmit document using electronic mail system
Monitor electronic mail

Competency: Manage software packages

Competency Builders:

Install software packages
Upgrade software packages
Document installation of software packages
Convert data files

Competency: Perform computer business graphics

Competency Builders:

Define purpose and types of graphics
Use appropriate reference materials
Create graphics
Proofread graphics
Edit graphics
Save graphics
Retrieve graphics
Print graphics to various output devices
Verify accuracy of output
Use graphic functions to create files, input data, process data, and produce output
Use graphics files with other application software

Competency: Use graphic user interface (GUI) techniques

Competency Builders:

Explain multi tasking environment
Setup data exchange between two different applications
Setup an object link between two different applications
Explain the use of dynamic link libraries

Unit: General Office Functions

Competency: Maintain a safe working environment

Competency Builders:

Comply with company safety and health rules and regulations
Use appropriate reference materials
Use equipment correctly
Use appropriate actions during emergencies
Maintain a clean and orderly work area

Competency: Maintain work flow

Competency Builders:

Organize work
Prioritize work
Apply time-management techniques
Complete assigned tasks in a timely manner
Coordinate with team members as needed

Competency: Demonstrate positive relations with customers/clients

Competency Builders:

Identify importance of repeat customers to business
Identify customer needs and wants
Provide prompt and courteous service
Resolve customer inquiries and complaints and/or refer customer to appropriate person

Competency: Perform telephone operations

Competency Builders:

Use appropriate reference materials
Display telephone etiquette
Operate equipment
Route calls
Listen assertively
Verify information
Screen calls
Record messages
Relay messages timely
Place calls
Log long-distance calls
Create telephone directories
Maintain telephone directories
Organize teleconferences
Use voice mail/messaging systems

Competency: Use facsimile machine

Competency Builders:

Explain how a facsimile machine operates
Record information regarding material being sent
Operate facsimile
Verify to sender that process has been completed
File copy of facsimile order
Maintain supplies for facsimile use
Log maintenance needs regarding facsimile

Competency: Assist visitors

Competency Builders:

Greet visitors
Screen visitors
Maintain visitor log
Make appropriate introductions
Portray professional image

Competency: Perform scheduling functions

Competency Builders:

Create calendar/schedule
Maintain appointment calendars
Process requests for appointments
Verify appointments

Competency: Use job-related reference materials

Competency Builders:

Identify reference materials
Assemble reference materials
Abstract information from reference materials
Compile data

Competency: Coordinate meeting arrangements

Competency Builders:

Make arrangements with meeting planners
Distribute agenda
Assemble relevant information
Notify participants
Confirm arrangements

Competency: Generate minutes

Competency Builders:

Record appropriate notes
Gather materials
Prepare minutes
Distribute minutes
File minutes

Competency: Coordinate travel plans

Competency Builders:

Check travel resources
Inquire about traveler's preferences
Arrange necessary transportation and lodging
Obtain passports and/or visas
Confirm arrangements
Prepare itineraries
Distribute itineraries
Alter arrangements

Competency: Perform mail functions

Competency Builders:

Identify various mail and delivery services
Process incoming mail
Distribute mail
Operate equipment
Process outgoing mail

Competency: Maintain office supplies

Competency Builders:

Prepare cost justification for purchasing supplies
Order supplies
Verify supply order against supplies
Store and secure supplies
Distribute supplies
Inventory supplies
Prepare inventory reports

Competency: Perform copying functions

Competency Builders:

Use appropriate reference materials
Operate equipment
Collate documents
Maintain equipment
Identify copying methods
Identify best copying method for task
Identify characteristics of paper stock
Keep appropriate records
Identify appropriate copyright applications

Competency: Maintain filing system

Competency Builders:

Give reasons for keeping records
Identify types of records needed
Develop proper techniques/procedures for maintaining records
Use appropriate reference materials
Describe procedure for initial inventory of records
Organize files
Index files
File information
Retrieve information
Consolidate files
Archive or destroy files
Secure files for legality and confidentiality
Follow retention schedule
Create new files
Update files
Prepare materials for filing
Sort documents
Apply cross-referencing and logging systems
Store documents
Locate documents

Competency: Maintain hardware and software

Competency Builders:

Use appropriate reference materials
Evaluate hardware and software
Recommend hardware and software
Schedule routine hardware maintenance
Update software
Report malfunction(s)
Maintain usage logs
Inventory hardware and software

Unit: Office Technology

Competency: Use telecommunications

Competency Builders:

Define the role of telecommunications in business
Use appropriate reference materials
Operate telephone systems
Operate fax machines

Competency: Perform basic word processing functions

Competency Builders:

Create glossary file
Store boilerplate material
Compose documents at keyboard
Tabulate multiple columns
Prepare new documents from existing ones
Merge selected copy with new information
Prepare various types of table options
Index text
Format text
Integrate database, spreadsheet, and graphics files
Convert documents from one system to another
Demonstrate use of computer thesaurus

Competency: Perform transcription functions

Competency Builders:

Identify various types of dictation/transcription equipment
Keyboard documents
Proofread documents
Edit documents
Save documents
Retrieve documents
Print documents

Competency: Use computerized filing system

Competency Builders:

Identify uses for electronic filing system
List advantages and disadvantages of electronic filing
Retrieve information from filing system
Store records electronically
Duplicate records electronically
Transmit records electronically
Maintain financial records

Competency: Perform database functions

Competency Builders:

Identify advanced database technology
Use appropriate reference materials
Create relational database
Enter elements into database
Proofread database
Edit database
Design report formats
Apply database management system (DBMS) commands
Print reports using data from multiple databases
Use database files with other application software
Verify accuracy of output

Competency: Perform desktop publishing functions

Competency Builders:

Define desktop publishing
Explain word processing functions in desktop publishing
Use appropriate reference materials
Use desktop publishing terms
Use desktop publishing software
Use graphic design and layout functions of desktop publishing
Design publications
Merge word-processing, graphics, database, and spreadsheet files
Proofread documents
Edit documents
Save documents
Retrieve documents
Print documents using various output devices

Competency: Perform computer business graphics

Competency Builders:

Define purpose and types of graphics
Use appropriate reference materials
Create graphics
Proofread graphics
Edit graphics
Save graphics
Retrieve graphics
Print graphics to various output devices
Verify accuracy of output
Use graphic functions to create files, input data, process data, and produce output
Use graphics files with other application software

Unit: General Accounting Functions

Competency: Apply arithmetical accounting skills

Competency Builders:

Compute cash discounts for various terms
Compute trade discounts
Compute extension, sales tax, and totals of sales slips
Compute markups and markdowns
Calculate rates of trade and cash discounts
Calculate unit prices given quantity prices
Calculate costs of portions of units
Solve problems involving fractions, decimals, and percentages
Solve commission problems
Solve finance-charge problems
Solve annual percentage rate problems

Competency: Apply accounting principles

Competency Builders:

Define accounting terminology
Define journals and ledgers
Identify basic accounting principles
Identify basic accounting applications
Identify computer accounting applications
Identify financial control procedures
Explain increases and decreases in accounts
Explain periodic reporting procedures
Prepare income statement
Prepare balance sheet columns
Prepare cash flow statement
Interpret balance sheets
Interpret income statements
Interpret cash-flow analysis statements

Competency: Perform manual accounting functions

Competency Builders:

Explain use of record keeping in relation to business and economic applications
Use appropriate reference materials
Analyze transactions
Use "T" accounts to label increases, decreases, and balances
Record transactions
Process receivables
Monitor expense accounts
Process payables
Prepare budgets
Process purchases
Prepare comparative (actual vs. budget) income statement

Competency: Perform automated accounting functions

Competency Builders:

Use appropriate reference materials
Operate equipment
Key data on numeric keyboard
Import or download data from computer records
Scan data from various media
Use integrated software package for simulation of accounting cycle
Set up chart of accounts for general ledger
Set up accounts payable and accounts receivable ledgers
Add accounts to general and subsidiary ledgers
Input account balances
Enter journal transactions
Process journal transaction
Prepare trial balance
Verify data and correct errors
Generate reports
Proofread accounting records and statements
Edit accounting records and statements
Save accounting records and statements
Retrieve accounting records and statements
Print accounting records and statements

Competency: Perform spreadsheet functions

Competency Builders:

Explain computer spreadsheet analysis
Use appropriate reference materials
Operate equipment
Create or format spreadsheet
Enter formulas
Move cells and ranges
Enter data on spreadsheet
Import or download data to spreadsheet
Apply data sort, data query, data fill, and data distribution
Export spreadsheet files to word processing, graphics and database files
Import spreadsheet files to word processing, graphics and database files
Proofread spreadsheet data
Edit spreadsheet data
Verify accuracy of output
Save spreadsheet
Retrieve spreadsheet
Print spreadsheet
Use spreadsheet functions to create files, input data, process data, and produce output
Use spreadsheet files with other application software

Competency: Perform payroll functions

Competency Builders:

Use appropriate reference materials
Collect payroll data
Process payroll
Comply with company policies and procedures
Comply with government and legal requirements
Maintain records and forms
Monitor personnel costs

Competency: Perform banking functions

Competency Builders:

Use appropriate reference materials
Prepare checks, deposit slips, and withdrawal slips
Maintain checkbook
Balance checkbook
Maintain petty cash
Balance petty cash
Explain automated banking transactions
Prepare banking records
Maintain banking records

Competency: Process cost accounting information

Competency Builders:

Define cost accounting, direct materials, direct labor and overhead
Define cost allocation methods
Identify source documents
Compute direct materials by job or process
Compute direct labor by job or process
Compute overhead rates to apply to jobs or processes
Compute cost of goods produced
Compute cost of goods sold
Journalize cost of goods produced and sold entries
Post cost of goods produced and sold entries
Compute cost of inventories
Prepare cost production reports
Prepare related records of job or process costs

Competency: Process end-of-fiscal-period information

Competency Builders:

Prepare worksheet
Prepare trial balance
Foot ledger accounts and compute balances
Prove equality of debits and credits
Locate errors
Record adjustments
Make appropriate extensions
Journalize basic adjusting, closing, and reversing entries
Post basic adjusting, closing, and reversing entries
Prepare basic income statement
Prepare basic balance sheet
Prepare basic cash flow statement

Unit: Specialized Accounting Functions

Competency: Process purchase orders

Competency Builders:

Identify source documents
Verify purchase requisitions
Prepare purchase orders and related documents/records
Prepare receiving reports

Competency: Process purchase invoices

Competency Builders:

Verify invoices against purchase orders and receiving reports
Check invoice calculations
Journalize purchase invoice entries
Post purchase invoice entries

Competency: Process purchase returns and allowances

Competency Builders:

Verify return of goods
Issue debit memorandums
Journalize purchase returns and allowance entries
Post purchase return and allowance entries

Competency: Process accounts payable

Competency Builders:

Identify source documents
Journalize payable entries
Post payable entries
Maintain subsidiary records
Reconcile subsidiary records to accounts payable
Prepare schedule of accounts payable

Competency: Process purchase payables and payments

Competency Builders:

Verify invoices, vouchers, and/or interoffice memorandums for payment
Identify purchase discounts
Prepare checks or electronic transfers
Mark source documents paid
Journalize payment entries
Post payment entries
Adjust subsidiary records

Competency: Process notes and interest payable

Competency Builders:

Identify source documents
Identify appropriate entries for notes payable
Compute payment of notes payable and interest
Record payment of notes payable and interest
Journalize note payables entries
Post note payables entries

Competency: Process invoices and receivables

Competency Builders:

Identify source documents
Verify sales invoices
Journalize sales invoice entries
Post sales invoice entries
Maintain subsidiary records

Competency: Process sales returns and allowances

Competency Builders:

Verify sales returns and allowances
Prepare credit memorandums
Journalize sales returns and allowance entries
Post sales return and allowance entries
Adjust subsidiary records

Competency: Process uncollectible accounts

Competency Builders:

Prepare schedule of aged accounts receivable
Apply company policies and procedures to determine uncollectibles
Prepare related documents
Journalize uncollectible account entries
Post uncollectible account entries
Adjust subsidiary records

Competency: Process collections

Competency Builders:

Identify due dates for various discount terms
Compare receipts with amount due
Verify checks, money orders, credit card receipts, and cash
Prepare cash proofs
Prepare deposits
Verify sales discounts
Prepare related documents
Journalize receipt entries
Post receipt entries
Adjust subsidiary records

Competency: Process notes and interest receivables

Competency Builders:

Identify source documents
Identify appropriate entries for notes receivable
Compute and record principal and interest of notes receivable entries
Journalize notes receivable entries
Post notes receivable entries

Competency: Perform checking account functions

Competency Builders:

Issue checks
Keep check records
Journalize entries
Post entries
Reconcile bank statement
File checks and deposit slips

Competency: Maintain petty cash fund

Competency Builders:

Set up petty cash fund
Pay petty cash vouchers
Reconcile petty cash fund
Replenish petty cash fund
Journalize petty cash transaction entries
Post petty cash transaction entries

Competency: Process employee payroll records

Competency Builders:

Obtain required employee forms
Set up employee payroll records
Update employee earnings records
Update employee benefits records
Prepare payroll distribution forms
Process employee time information

Competency: Process payroll

Competency Builders:

Calculate regular and overtime hours
Compute gross earnings
Compute deductions
Compute net pay
Prepare voucher checks
Prepare payroll checks
Journalize payroll entries
Post payroll and deduction entries

Competency: Process employer payroll taxes

Competency Builders:

Apply payroll laws and regulations
Prepare required tax deposits/payments
Prepare payroll tax returns as required
Prepare employee tax forms and reports as required
Journalize employer's payroll tax entries
Post employer's payroll tax entries
Post recorded liability for payroll tax entries
Post withholding and payroll taxes

Competency: Process accruals and deferrals

Competency Builders:

Define accruals and deferrals
Calculate amounts to be accrued and deferred
Journalize accrued and deferred liability and revenue entries
Post accrued and deferred liability and revenue entries
Journalize reversing entries as required
Post reversing entries

Competency: Use financial statements to make business decisions

Competency Builders:

Prepare balance sheet
Prepare income statement
Prepare cash-flow analysis
Prepare break-even analysis
Prepare budgets
Prepare comparative financial statement
Prepare cost and revenue analysis
Interpret financial statements
Make financial recommendations

Competency: Update value of plant and equipment assets

Competency Builders:

Differentiate between revenue and capital expenditures
Define depreciation methods
Calculate depreciation
Journalize plant and equipment asset entries
Post plant and equipment asset entries
Journalize depreciation entries
Post depreciation entries
Record disposition of plant assets by selling, discarding, and trading
Post disposal of plant and equipment asset entries

Unit: Computer Operations

Competency: Operate computer systems

Competency Builders:

Define job, batch, and job step
Describe data requirements
Use appropriate reference materials
Perform power-up and log-on procedures
Demonstrate basic programming skills
Use console device to interact with and respond to system messages
Secure supplies and resources
Follow processing procedures for each application/job
Run application/job
Describe scheduling priority
Describe transmittal form and transmittal log
Develop an audit trail
Handle materials and equipment in a responsible manner
Use electronic data interchange (EDI)

Competency: Maintain computer systems

Competency Builders:

Monitor system status and performance
Run diagnostics
Report computer system malfunction(s)
Report software malfunction(s)
Fix recoverable problems
Maintain security
Maintain computer log
Perform backup procedure(s)
Perform preventive maintenance
Follow log-off and power-down procedure(s)
Follow equipment maintenance procedures
Follow quality control procedures
Describe operator duties and job scheduling

Competency: Maintain security requirements

Competency Builders:

Apply business ethics
Follow security rules, regulations, and codes
Implement security procedures
Document security procedures
Perform security checks

Competency: Explain operation of peripheral devices

Competency Builders:

Identify peripherals and operating requirements of each
Identify primary devices used for personal computer auxiliary storage
Describe how data is stored on diskettes and hard drives
List speed and storage capacities of computer auxiliary storage devices
Describe attributes of diskettes and hard disks regarding speed and storage capacity
List types of disk storage used with large computer systems
Define role of tape storage in relation to personal and large computers
Describe security issues
Explain purpose of input devices (e.g., keyboard, mouse, scanners, pens, bar code readers, credit/debit/smart cards, voice, video, gloves, joysticks)
Describe operation of output devices (e.g., voice, speaker output devices, printers, plotters, printer sharing units, SCSI interface, video display)
Describe operation of multimedia (e.g., video, audiosound)
Describe operation of storage devices (e.g., tape, disk, CD-ROM)

Competency: Operate peripheral devices

Competency Builders:

Use appropriate reference materials
Load media devices
Start media devices
Unload media devices
Import, edit, and export video and audio
Set up print devices
Operate scanner devices
Operate print devices
Maintain print devices
Monitor peripheral equipment operations
Perform routine maintenance on peripheral devices
List appropriate control procedures
Demonstrate output processing, bursting, decollating, splitting, and shredding
Transmit via modem
Receive via modem
Search a CD-ROM library
Print information from a CD-ROM library
Describe device driver

Competency: Store media

Competency Builders:

Identify need for data library
Use appropriate reference materials
Retrieve stored media (e.g., on-line, off-line, permanent, off-site)
File stored media (e.g., on-line, off-line, permanent, off-site)
Initialize media
Catalog media
Maintain supplies
Maintain media library
Maintain backup records
Maintain company and/or government standards for media security
Maintain archives of company records required by policy or law

Competency: Maintain microcomputers

Competency Builders:

Use appropriate reference materials
Install PC
Change hardware
Set up system configuration
Install software packages
Respond to system messages
Run software applications
Back up systems
Restore systems
Report computer malfunction(s)
Report software malfunction(s)
Perform preventative maintenance

Competency: Explain operating systems

Competency Builders:

Identify operating systems and their attributes
Describe how commands handle tasks in operating systems
Describe various input/output systems
Describe the purpose of operating system utilities
Differentiate between a compiler and an interpreter
Describe the processing that occurs when an interpreter is used
Describe the processing that occurs when a compiler is used

Unit: Software Methodology

Competency: Solve fundamental software methodology problems

Competency Builders:

Explain basic concepts of algorithm development and programming
Use commands to implement algorithmic solution
Create test data for algorithmic solution
Test reliability of implementing algorithmic solution
Complete project (given formal specifications) requiring incorporation of control structures
Explain principles of program design (e.g., structure, object oriented, event driven)
Solve problems involving basic control structures (e.g., sequence, selection, iteration)
Describe different data types (e.g., numeric, alphanumeric)
Explain software design process (i.e., specification through implementation and testing)
Resolve issues of program implementation (e.g., debug, documentation, audit)

Competency: Describe tools used to design software systems

Competency Builders:

Explain modular design and programming, including specifications and design tools
Explain module (i.e., subroutine) implementation
Explain module testing
Explain module documentation
Explain module maintenance
Explain data normalization as used in defining databases
Explain computer-aided software engineering (CASE)
Explain object-oriented programming (OOP)
Differentiate build versus buy decisions

Competency: Develop software requirements

Competency Builders:

Use interviewing strategies to gather information
Describe different system design models (e.g., client server, centralized)
Identify system requirements
Develop informal specifications
Develop formal specifications
Develop documentation
Apply computing standards and methodologies
Apply security measures

Competency: Design software

Competency Builders:

Explain and/or chart process design
Write software (e.g., top-down, module testing)
Debug software system
Trace software system
Test software system and data
Apply computing standards
Apply security measures
Obtain customer approval

Unit: Operating Systems

Competency: Describe operating systems

Competency Builders:

Describe microcomputer operating systems
Describe minicomputer operating systems
Describe mainframe operating systems
Describe network operating systems
Describe how commands handle tasks in operating systems
Describe various input/output systems
Describe the purpose of operating system utilities
Differentiate between a compiler and an interpreter
Describe the processing that occurs when an interpreter is used
Describe the processing that occurs when a compiler is used

Competency: Explain central processing unit (CPU) control

Competency Builders:

Explain CPU processes
Explain CPU concurrency
Explain CPU scheduling
Explain CPU multitasking
Explain CPU multiprocessing

Competency: Describe memory management

Competency Builders:

Describe functions of primary memory
Describe functions of virtual memory (e.g., paging, segmentation)
Describe functions of extended memory
Describe functions of expanded memory
Describe functions of cache memory

Competency: Explain auxiliary storage management

Competency Builders:

Explain storage management software
Identify auxiliary storage media
Describe operational characteristics of storage media
Describe storage capacities of storage media
Describe retrieval methods of storage media
Differentiate between files and directories
Differentiate among management devices (e.g., disk, tape, CD-ROM)
Explain redundant array of inexpensive disks (RAID)
Explain mirroring concepts

Competency: Store media

Competency Builders:

Identify need for data library
Use appropriate reference materials
Retrieve stored media
File stored media
Initialize media
Catalog media
Maintain supplies
Maintain media library
Maintain backup records
Maintain company and/or government standards for media security
Maintain archives of company records required by policy or law

Competency: Explain security issues

Competency Builders:

Define backup and recovery
Explain disaster planing
Define authentication (e.g., passwords, access level)
Describe encryption techniques
Describe viruses and worms
Describe vaccines
Explain operating system penetration

Competency: Maintain security requirements

Competency Builders:

Implement security procedures
Apply business ethics
Follow security rules, regulations, and codes
Document security procedures
Perform security checks

Competency: Define open system concepts

Competency Builders:

Differentiate between proprietary and open system architecture
Explain X/OPEN
Explain purpose of Open Software Foundation
Explain purpose of UNIX International
Explain purpose of Corporation for Open Systems International
Identify the OSI Model

Competency: Operate system

Competency Builders:

Review automated scheduling software
Define job, batch, and job step
Describe data requirements
Use appropriate reference materials
Perform power-up and log-on procedures
Demonstrate basic programming skills
Use console device to interact with and respond to system messages
Secure supplies and resources
Follow processing procedures for each application/job
Run application/job
Describe scheduling priority
Describe transmittal form and transmittal log
Develop an audit trail
Handle materials and equipment in a responsible manner

Competency: Maintain system

Competency Builders:

Use appropriate reference materials
Monitor system status and performance
Run diagnostics
Respond to system messages
Report computer system malfunction(s)
Report software malfunction(s)
Fix recoverable problems
Maintain security
Maintain computer log
Perform backup procedure(s)
Perform preventative maintenance procedures
Change hardware
Install software packages
Restore system
Follow log-off and power-down procedure(s)

Competency: Administer system

Competency Builders:

Manage complete system
Manage network
Manage operating system
Manage applications

Unit: Application Programming and Design

Competency: Explain computer applications

Competency Builders:

Explain hardware component functions
Explain uses of a computer
Describe major events in the development of computers
Describe major types of software and their functions
Read computer publications
Interpret computer trends
Describe batch processing
Describe interactive processing
Describe ad hoc reporting

Competency: Develop computer applications

Competency Builders:

Use appropriate reference materials
Analyze specifications
Divide design specifications into logical blocks (e.g. flowchart, data flow diagram, system flows record and layout)
Identify constraints
Identify programming language
Identify input and output (I/O) requirements
Prepare logic using program-flow diagram

Competency: Explain programming theory

Competency Builders:

Explain the meaning of "reserved word"
Describe arrays and tables
Explain compilers
Differentiate between system documentation and user documentation
Describe what is meant by top-down design and structured programming
Identify the steps in the program development cycle
Design a decision table for a specified problem
Identify the steps and procedures required to develop test data
Explain the difference between recursion and iteration
Describe what is meant by data validation
Describe what is meant by "object oriented" programming

Competency: Apply programming theory

Competency Builders:

Demonstrate use of working storage variables
Write source code per standards
Use spacing charts to plan program output
Code a modular program
Interpret a simple hierarchy chart
Interpret a simple pseudocode design
Create a flow-chart
Perform program sorts
Demonstrate use of loops
Demonstrate use of logical operators (e.g., AND, OR, NOT)
Code error-handling techniques
Demonstrate use of data files

Competency: Explain programming languages

Competency Builders:

Outline history of programming languages
Identify primary use of programming languages and their weaknesses
List rules for naming variables

Competency: Use programming language

Competency Builders:

Perform character manipulation
Declare variables
Initialize variables
Modify variables
Demonstrate a function
Demonstrate a library
Demonstrate a subroutine
Demonstrate system calls
Apply conditional statements
Evaluate series of logical expressions
Code separate addition, subtraction, multiplication, and division statements
Declare a one-dimensional array
Initialize an array
Generate executable code

Competency: Use operating system

Competency Builders:

Apply appropriate text editor
Apply operating system commands
Apply operating system utilities

Competency: Test programs

Competency Builders:

Explain debugging statements
Perform debugging functions
Debug compilation errors
Create test data that checks logic and error routines
Execute program with test data
Correct execution errors
Perform unit and integration test
Analyze test results
Define auto testing software

Competency: Apply programming skills

Competency Builders:

Demonstrate knowledge of file and table processing
Develop program using data validation techniques
Develop interactive process
Develop menu-driven program
Develop database program
Develop program that utilizes a recursive process
Develop program using copy libraries
Develop program using system calls
Develop program using design tool

Competency: Develop documentation

Competency Builders:

Prepare program documentation
Prepare user documentation
Prepare data-flow diagrams
Update design documentation

Competency: Demonstrate knowledge of the systems design process

Competency Builders:

Identify processing requirements
Identify programming language
Use appropriate reference materials
Describe role of user and management in the development of a computer system
Describe use of data flow diagrams, system flowcharts and display screen layout forms
Conduct interviews
Design system inputs and outputs and processes
Create design documentation
Present system design

Competency: Evaluate system

Competency Builders:

Identify evaluation criteria
Develop test plan
Analyze test data
Present results
Recommend corrective action, if appropriate
Explain iterative nature of system evaluation

Competency: Implement system

Competency Builders:

Identify implementation plan
Identify conversion method
Train personnel
Present implementation plan

Unit: Network Operations

Competency: Explain communication standards

Competency Builders:

Identify the seven layers of the International Organization Standard's Open System Interconnection (OSI) Model
Describe each OSI layer, including their interconnectivity
Identify software standards for subnet, presentation layers, and file servers

Competency: Describe network structures

Competency Builders:

Differentiate topologies (e.g., hierarchical, ring, star)
Differentiate architecture(s)
Explain layering
Describe protocols (e.g., TCP/IP, IPX/SPX, etc..)
Describe frame types (e.g., SNA<802.3, 802.5)
Define local area network
Define different types of LANs
Differentiate between network operating systems and data distribution systems
Identify advantages and disadvantages of various LAN operating systems
List duties of LAN supervisor

Competency: Explain network transmission and media

Competency Builders:

Explain signals
Explain patterns
Explain error detection and correction
Explain speed of transmission
Explain use of media
Explain use of equipment
Explain role of network manager

Competency: Explain network connectivity and interoperability

Competency Builders:

Identify equipment connecting devices
Differentiate between sync and async devices
Identify software connecting devices
Identify media connecting devices
Identify type of interoperability (e.g., peer-to-peer, peer-to-host)
Identify problems of mixed vendor network implementation
Describe internetworking solutions
Describe cabling schemes and alternatives
Identify network topologies
List pros and cons of network interface cards
List pros and cons of network servers
Explain why internetting is useful or necessary
Describe levels at which internetting can occur
Identify protocols used for remote interconnecting and when each should be used
List common pitfalls when networking computers
Identify method used to evaluate emulators
Describe gateways (e.g., mainframe, protocol)

Competency: Describe network operating systems

Competency Builders:

Identify responsibilities of a network operating system
Explain installation procedure for network operating systems
Explain commands needed to use network operating systems
List characteristics of a network interface card (NIC)
Define criteria used to describe network servers
Define criteria used to evaluate network operating systems

Competency: Describe potential networking problems with applications software

Competency Builders:

Describe potential hard disk compatibility problems
Differentiate between site multi user and single user licenses
Describe necessary precautions included in programs used on networks

Competency: Explain network management

Competency Builders:

List steps in mapping a network
Explain why files must be organized according to owners, users, and privileges
Describe common standards for setting up and naming files
List criteria used to determine if a file should be network accessible
Identify methods to increase performance
Define hierarchical directory
Explain methods used to determine how many servers should be used
State reasons for channel and cable bottlenecks

Competency: Explain network security

Competency Builders:

Explain need for data protection
Identify common backup devices
Explain criteria for selecting a tape system
Differentiate between hard and soft errors
Contrast streaming and file-by-file backup systems
Explain process for archiving files
Explain necessity for network security
Identify levels of network sedulity and reasons for their existence

Competency: Explain installation procedures

Competency Builders:

Explain why an installation log is necessary
Identify methods of distributing cable, including modeling examples
Identify problems associated with cable installation
Describe types of cable, cable connectors, and grounding techniques
Explain cable testing and tolerance levels
Identify sources of interference and include methods to overcome each

Competency: Use network knowledge

Competency Builders:

Use electronic/voice/multi-media mail
Share files
Use dial-in access
Make backups
Share resources
Explain software control
Apply security and authentication

Competency: Apply network operations

Competency Builders:

Assess user needs to determine which LAN operating systems to use
Demonstrate applications used on LANs
Describe how the network protocols work together
Operate the system in a multi-user environment
Demonstrate knowledge of various networks and compatibility
Differentiate among various topologies
Identify which network operating system to use
Build synchronous transmission circuit using a modem
Build synchronous transmission circuit using a modem
Connect PCs to form a network
Connect two PCs networks
Perform file to file copy in a PC network
Implement print queue in a PC network
Configure file server in a PC network
Connect PC to mini or mainframe
Link mixed vendors (e.g., PC to Mac)
Interconnect via backbone network
Build small ethernet or token ring network

Competency: Administer network

Competency Builders:

Use appropriate reference materials
Apply current LAN concepts and technology
Attach computers and peripherals to LAN
Change computer hardware
Set up system configuration
Install LAN manager software
Install software packages
Respond to system messages
Troubleshoot system
Run software applications
Back up and restore systems
Perform system analysis
Use security procedures
Perform preventative maintenance
Select access control and security
Outline resource management
Install cabling
Install network
Analyze network operations
Check physical and virtual connections
Modify network
Apply standards
Acquire licensing
Plan disaster recovery
Address protocols (e. g., ethernet, token ring, Arcnet)
Monitor network activity/performance

Competency: Perform network maintenance and diagnostics

Competency Builders:

Execute network diagnostics program for software
Execute network diagnostics program for hardware
Apply standard and protocols
Document action(s) taken

Unit: Basic Mainframe Concepts

Competency: Describe mainframe operations

Competency Builders:

Identify types of mainframe memory
Identify data storage techniques used by mainframe operation
Explain how data is stored in mainframe computer memory
Explain how a mainframe computer system executes program instruction
Explain mainframe storage capacity

Competency: Describe interface techniques

Competency Builders:

Identify elements of mainframe user interface
Identify mainframe hardware components and their advantages and disadvantages
Trace evolution of user interface software for mainframe
Illustrate various forms of mainframe menus
Describe mainframe graphical user interface (GUI)

Competency: Explain information processing cycle

Competency Builders:

Define mainframe operating systems
Define data processing terminology
Describe the difference between data files and program files
Differentiate between internal and external commands
Differentiate among interactive, transaction-oriented, and batch processing
Describe processing capabilities of computer operations
Specify roles of systems, procedures, and personnel in mainframe information processing
Explain functions of input, output, revision, distribution, storage, and reproduction

Competency: Explain purpose of mainframe database systems

Competency Builders:

Define mainframe database
Explain terms used in mainframe database systems
Describe common function of mainframe database systems

Competency: Use mainframe database system

Competency Builders:

Enter data into database and sort
Enter data into database and retrieve
Enter data into database and select
Prepare formatted business forms using mainframe database

Unit: Computer Hardware Design

Competency: Explain standards

Competency Builders:

Identify OSI, IEEE, ISO, and CCITT standards
Identify standard setting bodies and their proclamations
Explain conformance and APIs

Competency: Describe computational site environment

Competency Builders:

Identify environmental requirements
Identify power requirements and power supplies
Identify ergonomic issues
Identify structural capacities
Identify local codes

Competency: Differentiate among architecture and processor types

Competency Builders:

Describe architecture and processors of microcomputers
Describe architecture and processors of minicomputers
Describe architecture and processors of mainframes
Explain instruction sets

Competency: Analyze computer systems architecture

Competency Builders:

Describe the principles and operation of addresses and interrupts
Describe the principles and operation of volatile and non-volatile memory
Describe the principles and operation of advanced memory techniques
Define individual system blocks
Draw systems configuration in block detail
Interpret computer acronyms
Describe priorities and interrupts at systems level
Identify direct memory access data handling system(s)
Define functions of advanced memory techniques (e.g., virtual, pipeline, cache)
Describe how commands handle tasks in operating systems
Describe various input/output systems
Describe the purpose of operating system utilities
Differentiate between a compiler and an interpreter
Describe the processing that occurs when an interpreter is used
Describe the processing that occurs when a compiler is used

Competency: Describe operation of chips and boards

Competency Builders:

Describe chip configuration and structure
Describe operation of memory boards, including chip sizes
Describe operation of mother boards
Describe operation of compressor boards (e.g., math, graphics, FAX, modems, voice)
Describe operation of controller cards
Describe operation of network interface cards
Describe operation of PCMCIA

Competency: Describe operation of connectivity devices

Competency Builders:

Describe operation of baluns
Describe operation of multiplexers, MODEMS, CODECS, DSU
Describe operation of switches, gateways, bridges, routers, brouters, and repeaters
Describe operation of test equipment (e.g., protocol analyzers)

Competency: Explain operation of microprocessor systems

Competency Builders:

Describe essential components of microprocessor and their functions
Describe principles and operation of BUS concepts (e.g., VESA, EISA)
Describe principles and operation of types of memory circuits
Identify operating systems (e.g., DOS, OS/2, UNIX) and their attributes
Describe microprocessor instructions sets
Describe principles and operation of microprocessor machine code
Demonstrate use of microprocessor machine code
Decode microprocessor machine code
Identify types of input and output devices and peripherals
Describe principles and operation of storage devices
Interface input and output ports to peripherals
Identify central processing unit building blocks and their uses
Identify levels of computer languages

Competency: Troubleshoot a microcomputer system

Competency Builders:

Draw system configuration in block detail
Identify priorities and interrupts at system level
Operate computer system architecture
Repair computer system architecture
Demonstrate use of volatile and non-volatile memory
Repair or replace volatile and non-volatile memory

Competency: Install computer system (i.e., monitor, keyboard, disk drive, and printer)

Competency Builders:

Configure system
Verify system
Print copy of root directory to printer
Document system installation

Competency: Explain operation of peripheral equipment

Competency Builders:

Identify types of card and paper-tape equipment and interface controllers
Define printer types and interface controllers
Explain the operation of typical magnetic tape equipment and interface controllers
Describe disk equipment and interface controllers
Define environmental requirements for peripherals and media

Competency: Repair peripheral equipment

Competency Builders:

Troubleshoot and repair disk equipment and interface controllers
Troubleshoot and repair display terminals and interface controllers, including touch screens
Troubleshoot and repair printers and interface controllers, including laser printers
Troubleshoot and repair mouse
Troubleshoot and repair bar code scanner
Troubleshoot and repair CD-ROM

Competency: Explain communication interfacing

Competency Builders:

Identify EIA, IEEE and CCITT standards
Differentiate sync and async devices
Define networking levels or layers
Define protocols
Define packet switching
Define multi-user systems

Unit: Database Modeling and Design

Competency: Explain database concepts

Competency Builders:

Define terms used in database systems
Describe common functions of database systems
Explain commonly used database structures (e.g., hierarchical, relational)
Explain database security techniques

Competency: Create a database model

Competency Builders:

Explain referential integrity and normalization
Identify data elements
Identify keys
Create database structure

Competency: Perform database functions

Competency Builders:

Use database package to create, input, edit, and display fields and records
Analyze structure of database files
Perform calculations with a database file
Alter structure of database file
Sort records based on multiple fields
Identify advanced database technology
Use appropriate reference materials
Create relational database
Enter elements (data) into database
Proofread database
Edit database
Design report formats
Apply database management system (DBMS) commands
Print reports using data from multiple databases
Use database files with other application software
Verify accuracy of output

Unit: Small Business Management

Competency: Explain entrepreneurship

Competency Builders:

Identify characteristics of entrepreneurs
Identify qualities and skills needed by business owners
Identify means of obtaining technical assistance
Identify advantages and disadvantages of owning a small business
Identify personal risks of owning a small business
Describe basic factors contributing to business success
Describe a franchise-dealer relationship

Competency: Evaluate entrepreneurship as a personal goal

Competency Builders:

Evaluate personal interests and resources (e.g., time, energy, skills)
Compare personal interests and skills with those necessary for entrepreneurship
Assess aptitude to become a successful entrepreneur
Identify motives for becoming an entrepreneur

Competency: Develop a business plan

Competency Builders:

List sources of information for starting a business
Classify local and state requirements for starting business
Identify risks of creating a new business
Differentiate among market characteristics
Analyze financing of business ownership
Develop marketing strategies

Competency: Identify role of small business in the economy

Competency Builders:

Identify factors that contribute to the success and failure of small business
Describe effects of supply, demand, profit, and competition on small business
Explain relationship of small business to a national (USA) and global economy

Competency: Analyze how legislation affects small business

Competency Builders:

Identify legal issues faced by entrepreneurs
Describe the relationship between government and entrepreneurs
Explain the effects of regulation on the business operation
Identify when and how to obtain appropriate legal assistance
Participate in the legislative process

Competency: Evaluate factors affecting small business management

Competency Builders:

Identify advantages and disadvantage of various types of ownership
Identify cooperative arrangements
Describe legal forms of retail businesses
Differentiate between various types of insurable business risks
Describe social and ethical problems that affect business
Classify types of government regulations that affect business
Analyze current trends in business
List costs that must be considered when starting a business
Select best location and layout for a business

Competency: Identify marketing mix

Competency Builders:

Explain importance of having the right product
Explain importance of having the product at the right place
Explain importance of having the product with the right promotion
Explain importance of having the product at the right price
Explain importance of having the product at the right time

Competency: Promote products and/or services

Competency Builders:

Explain selling function
Explain promotion function
Describe relationship of sales to promotion
Describe how to plan for special events and public relations activities
Explain importance of maintaining a check on competitors' promotions
Identify factors used to select appropriate products
Prepare merchandise/buying plan
Maintain vendor information and select appropriate vendors
Identify selling price
Keep abreast of merchandising trends

Competency: Manage customer relations

Competency Builders:
Identify advantages of customer services and accommodations
Identify advantages of attractive, comfortable facilities
Explain importance of price, quality, and variety
Use acceptable techniques in handling customer complaints

Competency: Minimize internal theft

Competency Builders:

Establish internal theft policy
Identify types of internal loss
Identify potential loss situations
Report employee theft
Follow company policies regarding internal theft
Follow security procedures

Competency: Explain financing methodologies

Competency Builders:

Explain leasing
Explain stock ownership
Explain bond ownership
Explain convertible securities
Explain bank loans

Competency: Identify costs of financial services

Competency Builders:

Classify revenue and expenses
Speculate on revenue sources and expenses
Identify start-up costs
Explain means of obtaining financial assistance
Explain importance of a sound credit rating
Outline long-range financial plans
Explain how sources of finance are used in business operations
Compare financial services available from financial institutions

Competency: Prepare financial records and reports

Competency Builders:

Record receipts and payments
Adjust cash flow upon the introduction of a variable
Justify budget items
Record income and expenditures
Report employee records for audit and taxation purposes

Competency: Explain management's role in operating a business

Competency Builders:

Explain importance of organizational skills
Identify management functions performed by entrepreneurs
Describe responsibilities and rewards of small business management
Compare specific management techniques
Explain importance of time management
Identify benefits of membership in professional/trade associations
Identify professional support system(s)
Explain need for basic accounting skills
Identify free sources of information and support
Explain importance of fundamental marketing skills
Describe benefits of continuous employee training

Competency: Practice safety precautions

Competency Builders:

Maintain safe work area
Operate equipment safely
Practice safety to prevent accidents
Follow procedures for reporting accidents
Follow safety procedures for special populations
Follow government regulations (e.g., OSHA, EPA)
Follow sanitation and hygiene procedures
Report emergencies to proper authorities
Identify emergency evacuation plans
Operate fire and safety equipment

Competency: Comply with government regulations

Competency Builders:

Identify sources of information and assistance
Identify regulations, licensing, and permits affecting business operations
Identify taxes affecting small businesses
Develop policies of compliance
Develop basic first aid skills
Monitor changing regulations

Competency: Perform management activities

Competency Builders:

Define management
Describe basic principles of good management
Identify effective leadership traits
Develop management objectives
Explain role of management in operating a business
Identify purposes of forecasting
Identify purpose of selecting appropriate marketing strategies
Develop short-term and long-term action plans
Describe importance of performance measurements and record keeping
Explain importance of keeping informed of developments and trends affecting business
Explain importance of planning for emergencies
Prepare managerial reports about production, personnel, equipment, and operational costs
Identify elements of a general budget
Describe use of credit by a business
Identify accounting statements that provide business information
Develop short/long range plans including Equal Access/Equal Opportunity (EAEO) guidelines
Develop procedures for handling employee complaints
Evaluate job applicants
Recommend employees for promotion
Identify contract laws
Describe the effects of insurance
Describe risk management alternatives (e.g., fire, theft, liability)
Describe consumer credit plans
Describe procedures for collection of accounts
Explain inventory control systems
Explain need for an equipment maintenance plan
Explain need for a facility maintenance plan

Unit: Supervision

Competency: Manage human resources

Competency Builders:

Apply appropriate management and leadership styles
Use foresight to anticipate and manage change
Display managerial and supervisory skills
Apply human relations skills
Develop management objectives
Create and/or implement organizational charts
Clarify company policies and procedures
Maintain office procedures manual(s)
Establish office procedures
Prepare and/or monitor budgets
Prepare managerial reports
Analyze production reports
Maintain appropriate work environment
Conduct tours
Monitor progress
Prepare and communicate productivity reports
Provide and/or coordinate training for new policies
Troubleshoot office problems
Communicate performance expectations
Counsel employees about career objectives
Maintain performance records
Adhere to company policies regarding discrimination and harassment
Address employees regarding disciplinary action(s)
Recommend employees for promotion
Explain procedure for handling grievances
Evaluate employee performance
Document personnel issues

Competency: Manage projects

Competency Builders:

Conduct needs analysis
Set priorities
Research information
Develop goals and objectives
Develop strategic plan
Develop project budget
Apply forecasting techniques
Apply prioritizing techniques
Schedule work assignments
Collect data
Analyze data
Act on data
Monitor project progress
Meet project timelines
Monitor budget
Apply quality measures and counter measures

Competency: Manage work flow

Competency Builders:

Plan office layout for workflow
Create organizational charts
Communicate operating policies and procedures
Maintain office procedures manual(s)
Identify production standards
Interface with other departments
Prioritize work
Assign work
Delegate work
Provide instruction
Monitor progress
Complete productivity and/or managerial reports
Complete assigned tasks in a timely manner
Coordinate with team members

Competency: Conduct staff/team meetings

Competency Builders:

Plan meeting
Set agenda
Set and schedule meeting
Schedule meeting room
Invite appropriate personnel
Identify need for outside speakers
Assign someone to take minutes
Make introductions
Invite questions and comments, and group participation
Focus on agenda items, but maintain issues list as they arise
Decide appropriate action, time frame, and accountability to tasks
Monitor time
Close meeting on time
Publish minutes in timely manner to appropriate persons

Competency: Conduct training

Competency Builders:

Secure training resources, materials, and equipment
Assess training needs
Train employees
Evaluate progress
Provide appropriate feedback
Document training participation

END

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